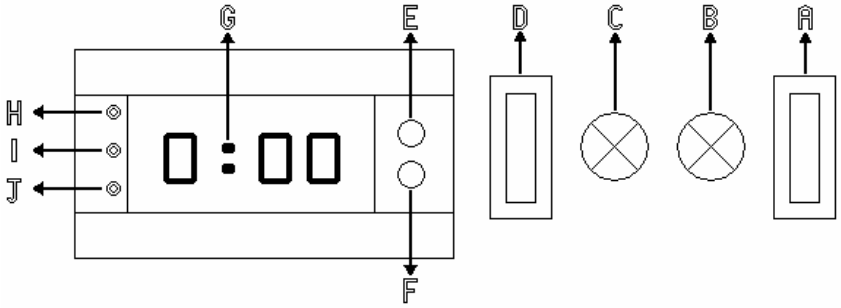
Notes:

TURBOQUIP BLAST CHILLER

The primary usage of the Turboquip Blast chiller is for effective bacteria management. The blast chiller will bring protein based food products from temperatures above 120°C to the safety zone below 7°C in a shortened time frame thus eliminating the generation of bacteria. Bacteria generate between 7 and 65°C, and double in quantity every 20 minutes. Leaving food at room temperature to cool down is the primary cause for food poisoning.

The blast chiller can also be used for blast freezing.

THE CONTROL PANEL:



A - ALARM
B - BUZZER
C - POWER
D - ON/OFF SWITCH
E - PROGRAM BUTTON "UP"
F - PROGRAM BUTTON "DOWN"
G - DIGITAL DISPLAY
H - INDICATES REFRIGERATION
I - INDICATES DEFROST IN PROCESS
J - INDICATES FAN IN OPERATION

INSTALLATION

IMPORTANT!!

Do not push the blast chiller up against the wall, the unit needs at least 150 mm for the hot air to escape from the compressor.

Install in a well-ventilated area, preferably away from any cooking equipment.

Ensure that the drip tray at the rear of the unit is under the drainage pipe and secure.

Plug the unit into a 15 AMP wall socket.

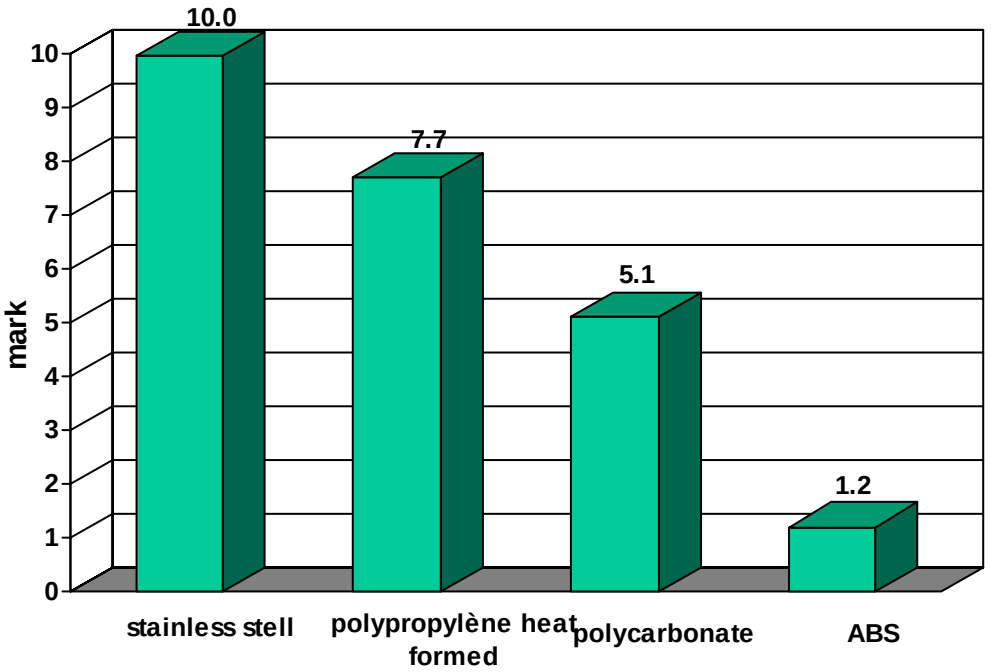
Ensure the interior probe is not entangled in the fan.

OPERATION

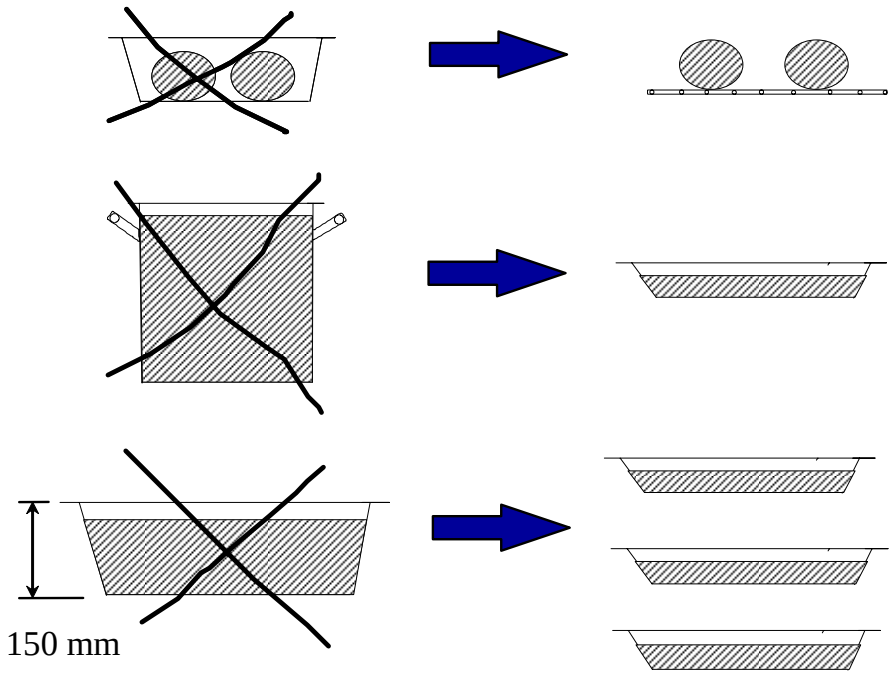
1. Ensure unit is plugged in and switched on at the wall.
2. The control panel and on/off rocker switch will illuminate.
3. Turn rocker switch to on position.
4. Before commencing with operation, the unit is set up for blast chilling and not blast freezing in the factory. Therefore the control panel will regulate refrigeration until the core temperature of the product reaches +9ºC. This maintains the surface temperature of approx +4ºC, which is a bacteria safe temperature.
5. Should you wish to reset the core temperature, the procedure is as follows:-
   a. Depress both “E” & “F” simultaneously.

      The set point temperature is then displayed.
   b. Toggle up with “E” and down with “F” until reaching desired set point.
   c. Depress both “E” & “F” simultaneously to confirm setting.
   d. After 5 seconds the unit will return to normal operation.
   e. To check settings, depress “E” & “F” simultaneously then wait 5s.

THERMAL QUALITY OF CONTAINERS



RECOMMENDED FOODSTUFF PACKAGING



6. **<u>Blast Freezing</u>** In order to blast freeze a product the controller should be set at a temperature of –10ºC. This will facilitate complete deactivation of bacteria multiplication. The resultant surface temperature should be ± (-18ºC)

   To activate this cycle, follow steps “a-e” above.

BLAST CHILLING:

As previously mentioned the unit is set up to blast chill the core of the product to a temperature of 10ºC.

1. Place product from cooked state of 65ºC or greater in a stainless steel container of no deeper than 65 mm in the blast chiller rack.
2. Insert the core probe into the centre of the food.
3. Fill rack to no more than 10 trays with core probe inserted into largest of products.
4. Large joints of meat should be placed in shallow trays or on flat surfaces for most effective cooling, with the core probe inserted into centre of product.
5. Close door and ensure rocker switch ”D” is in “ON” position.
6. Wait for buzzer to sound.
7. Depress “D” to silent buzzer. The controller will display:
   a. A1 Low Temperature Alarm
   b. A2 High Temperature Alarm
8. Switch rocker switch to “OFF” position.
9. Remove product from Blast chiller and refrigerate

MAINTENANCE

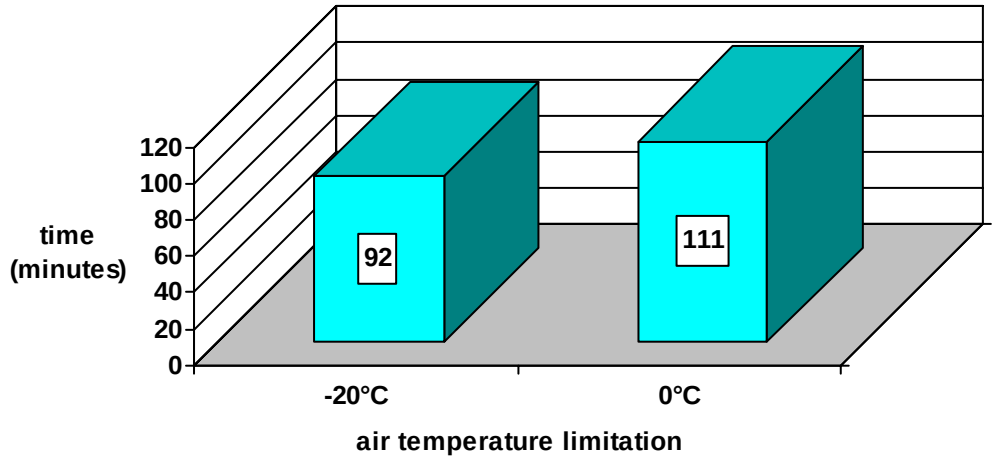
1. Unit should be switched off at the wall when not in use.
2. Condensation tray at the rear of the unit should be emptied after every cycle. And replaced to original position.
3. The tray rack can be removed for cleaning in the event of spillages.
4. Ensure front breather panel is kept clean and free from obstruction allowing adequate ventilation.

TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	SOLUTIONS
1. Unit does not switch on and power light does not illuminate	a. Not plugged in b. Faulty power cable c. Electrical supply	a. Plug in to power supply b. Call technician c. Call electrician
2. Neon power on light illuminated but blast chiller does not operate	a. HP-LP switch tripped b. Blocked Condenser c. Faulty condenser fan d. HP switch faulty e. Gas leak	a. Reset by b. Clean and clear obstructions at the rear of unit c. Replace fan d. Replace switch e. Call Technician
3. Unit runs but does not refrigerate	a. Faulty compressor b. Faulty solenoid c. Faulty expansion valve d. Loose wiring e. Controller programming	Call service technician
4. Fans inside cabinet not running	a. One fan not working b. All fans faulty	a. Faulty fan or loose connection to fan b. Faulty on/off switch c. Faulty controller d. Unit in defrost cycle

IMPACT OF AIR TEMPERATURE LIMITATION UPON PERFORMANCE

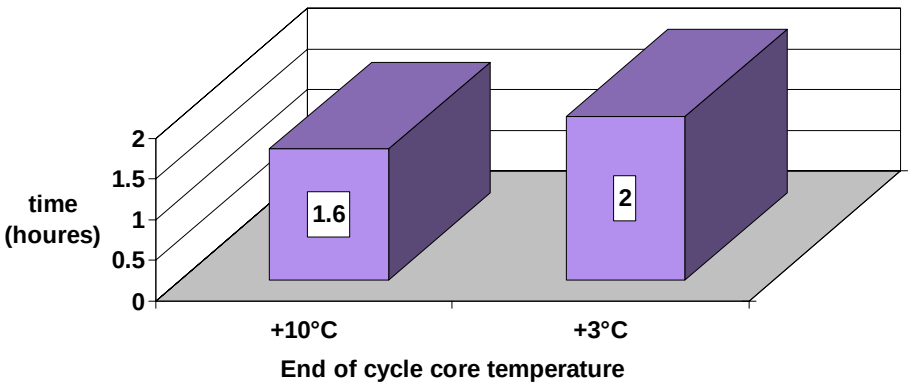
Blast Chilling test performed with 25 kg of mashed potatoes
(14 covered containers of 1.8 kg each)



IMPACT OF END OF CYCLE CORE TEMPERATURE UPON PERFORMANCE

Blast Chilling test performed with 25 kg of mashed potatoes
(14 covered containers of 1.8 kg each)

Duration of cooling from 65°C, core temperature



APPLICATIONS

All foodservice operations are faced with varying production demands, such as, time constraints, labour challenges, a need to control food costs and ensure safety. Blast chilling addresses all of these daily concerns with the additional benefit and piece of mind of *safety*.

- Blast Chillers are one of the most versatile pieces of equipment available today.
- This equipment can be used to blast chill raw, par-cooked, or fully cooked foods.
- Blast Chillers compliment all other major pieces of Turboquip equipment. Foods can be blast chilled before or after using Turboquip cooking or holding equipment.

"Cook-Chill" is a relatively new concept in food preparation for retail foodservice operators. A concept that has gained popularity due to the reduced costs of implementation, substantial flexibility gained in menu variety, labour usage, and the increased concerns for food safety by consumers.

The time foods spend in the temperature "*danger zone*" 5°C - 60°C directly contributes to the growth and spread of contamination. Therefore it is important to quickly move foods through the danger zone and monitor the time necessary to do so.

ADVANTAGES TO RAPID CHILLING

There are several food characteristics, which are effected by the cooling process. The ability to minimize the time foods are allowed to spend in the danger zone impacts these characteristics. Below is a list of advantages to the rapid chilling of foods:

Texture

- Minimizes the loss of moisture
- Minimizes the softening of food product resulting from pectin breakdown
- Minimizes the growth of bacteria and molds contributing to the breakdown of product tissue

Nutrition

- Reduces vitamin loss (ascorbic acid and thiamin most susceptible)

Color

- Preserves rich and bright colors (rapid cooling reduces the Enzymatic action which facilitate the loss of color)

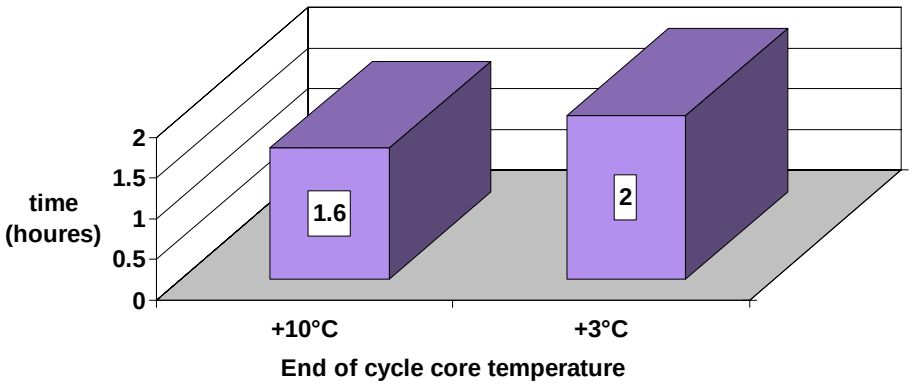
Flavor

- Preserves the desired flavor through the reduction of psycrophilic bacteria and molds

IMPACT OF CONTAINER'S COVER UPON PERFORMANCE

Blast Chilling test performed with 25 kg of mashed potatoes
(14 containers of 1.8 kg each)

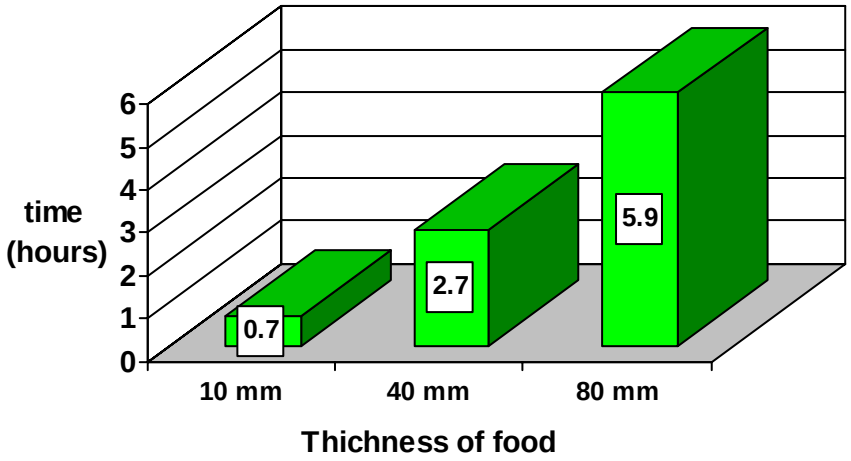
Duration of cooling from 65°C, core temperature



IMPACT OF FOOD THICKNESS UPON PERFORMANCE

Tests performed by University of Bristol, UK

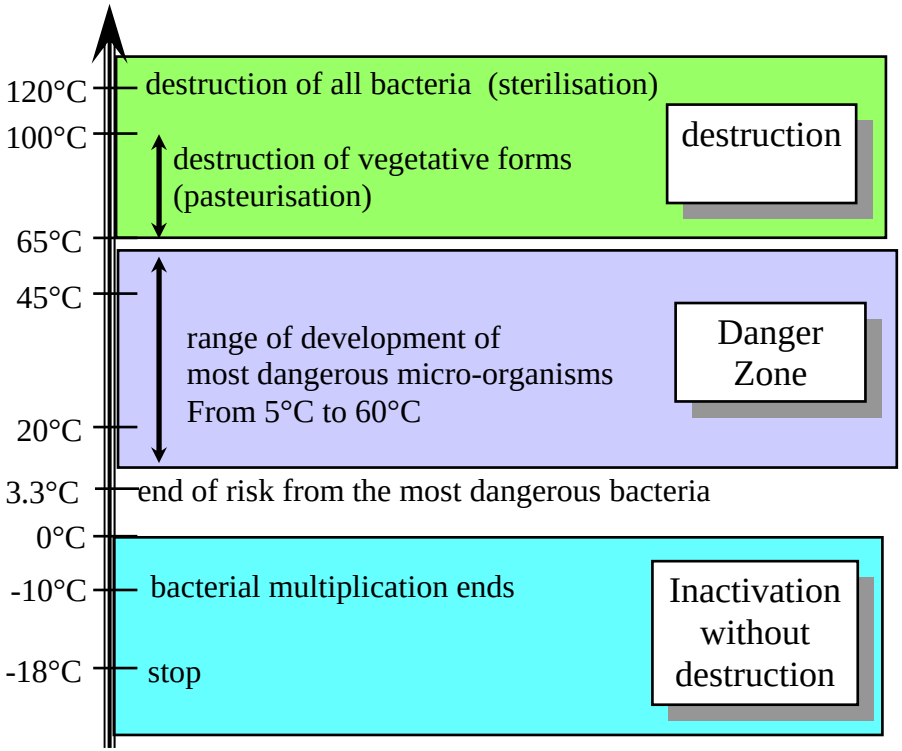
bolognese sauce, air flow 3 m/s, air temperature stable at -2°C, covered containers



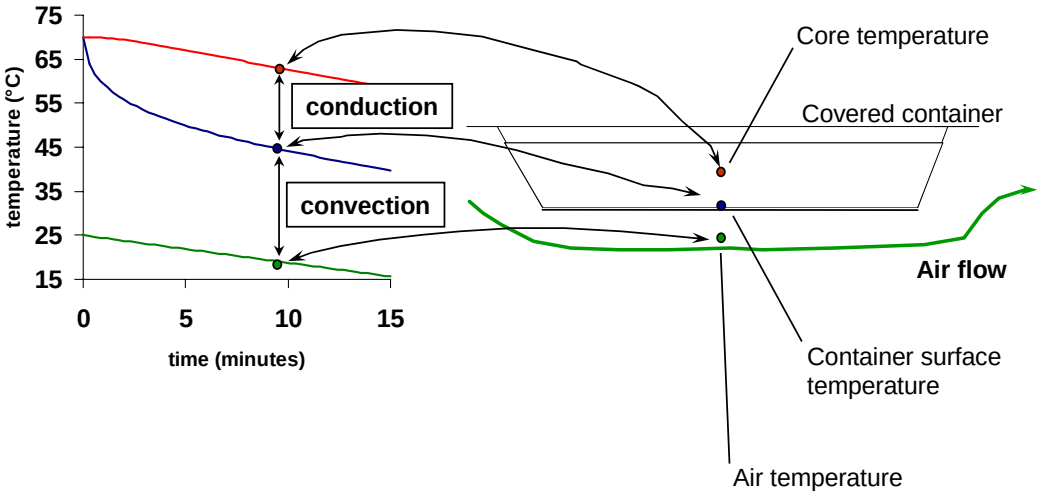
WHY TO USE A BLAST CHILLER / FREEZER?

- To serve safe food
- To be in accordance with regulation and / or HACCP program
- To increase shelf life
- To increase production capacity
- To help some kitchen works
- To permit variety and / or menu expansion
- To reduce labour cost
- Because cold cabinet is not designed to chill hot food

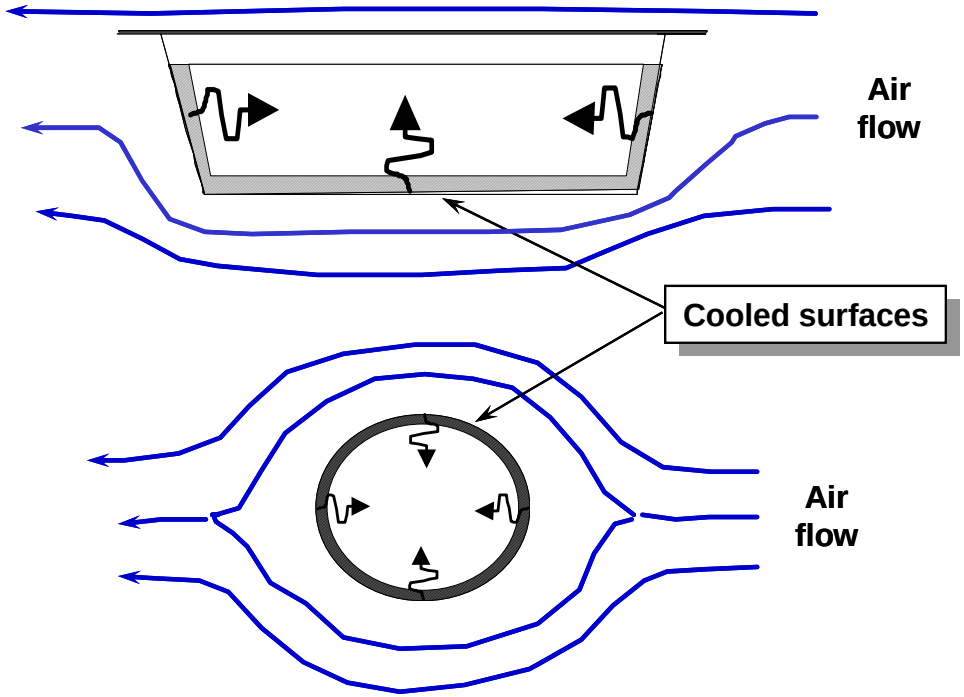
ACTION OF TEMPERATURE ON THE MICRO-ORGANISMS



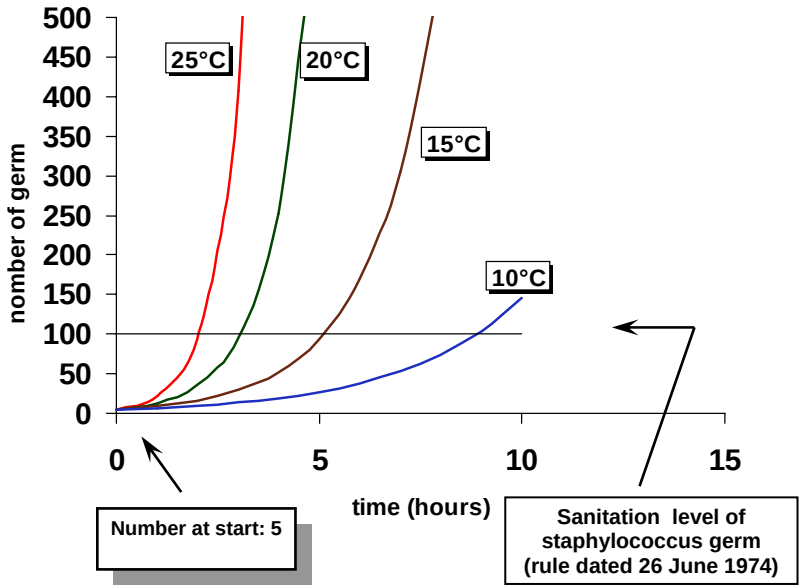
PRINCIPLES OF HEAT TRANSFER



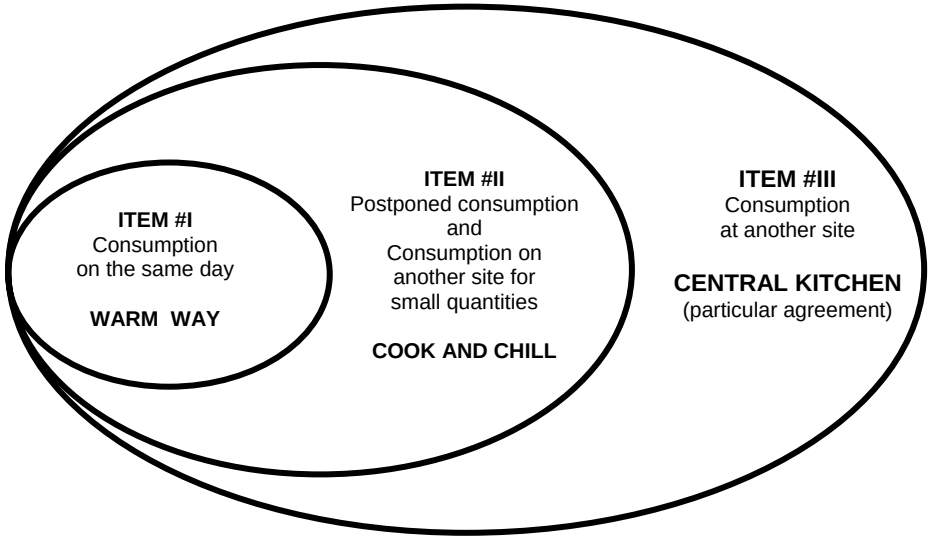
HEAT TRANSFER SURFACES



GERM MULTIPLICATION
BY PRODUCT TEMPERATURE

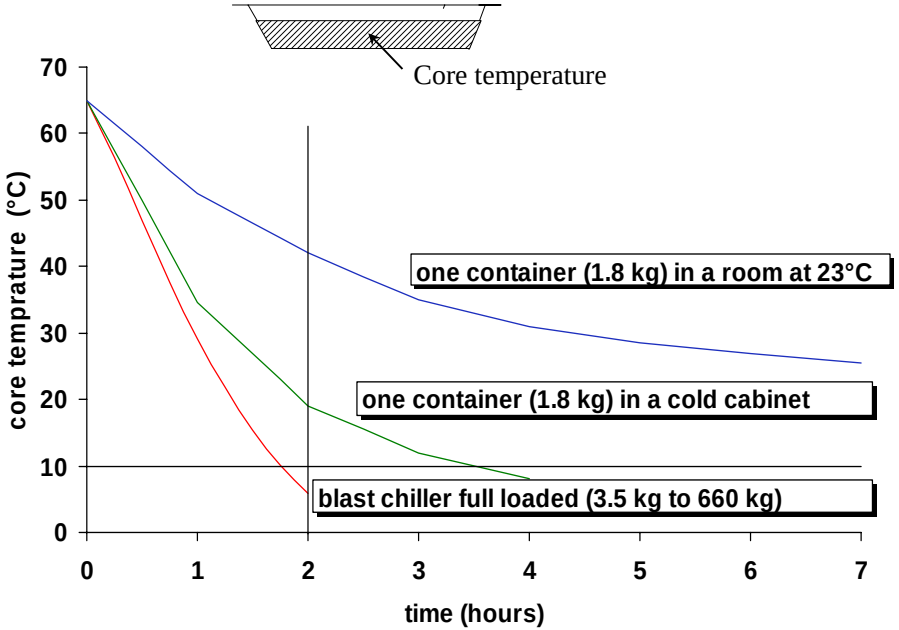


EUROPEAN REGULATION



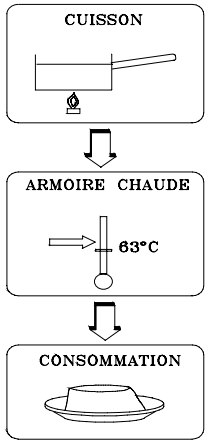
COMPARISON OF DIFFERENT TYPES OF COOLING OVER DURATION OF COOLING

1.8 kg of mashed potatoes in covered containers

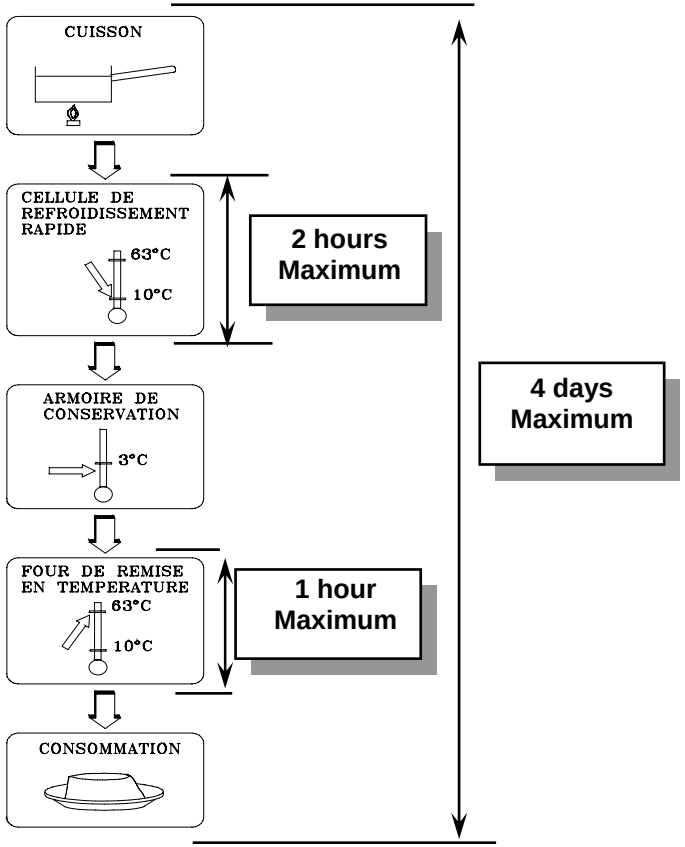


COOK AND CHILL SYSTEM
based on European regulation

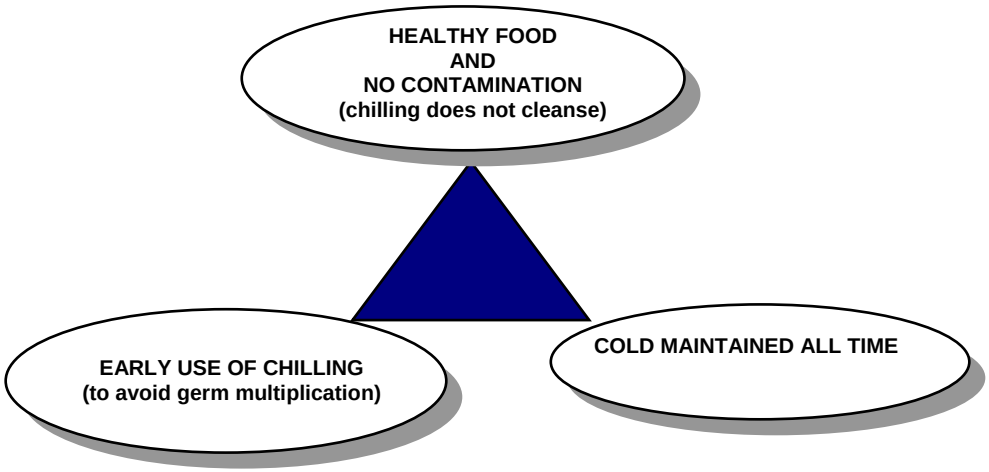
WARM WAY



COOK AND CHILL



SAFE FOOD AND LONGER SHELF LIFE



BLAST CHILLING

TURBOQUIP

BLAST CHILLER